

We claim:

1. A path transitioning data switch comprising:
a plurality of switching modules; and
a backplane interconnecting the switching modules
5 on a plurality of paths,
wherein flow integrity of data units for a flow
undergoing path transition is maintained by temporarily
disabling one or more of the switching modules from
transmitting the data units for the flow to the backplane.

10 2. The path transitioning data switch of claim 1
wherein the switching modules are disabled from
transmitting the data units for the flow when the path
transition is commenced, and are enabled after the path
15 transition has been completed and an interval has passed to
ensure that all data units for the flow transmitted to the
backplane prior to disabling the switching modules have
cleared the backplane.

20 3. The path transitioning data switch of claim 1
wherein the backplane includes a multicast fabric and a
unicast fabric, and wherein the path transition is made
from the multicast fabric to the unicast fabric upon source
learning an address of a network device that provides the
25 flow.

4. The path transitioning data switch of claim 3
wherein all switching modules are temporarily disabled from
transmitting data units having the address undergoing
30 source learning as a destination address to the backplane.

5. The path transitioning data switch of claim 4 wherein the switching module coupled to the network device whose address is undergoing source learning is temporarily disabled from transmitting data units having the address as a source address to the backplane.

6. The path transitioning data switch of claim 5 wherein the temporarily disabled switching modules are enabled to transmit to the backplane after source learning has been completed.

7. The path transitioning data switch of claim 6 wherein the temporarily disabled switching modules are enabled after an interval has passed to ensure that all data units having the source learned address as the source address or the destination address and transmitted to the multicast fabric have cleared the backplane.

8. The path transitioning data switch of claim 7 wherein said interval is predetermined.

9. A path transitioning data switch having a plurality of switching modules and a backplane interconnecting the switching modules on a plurality of paths, the data switch comprising:

means for transmitting a first data unit for a flow from a first switching module to a second switching module on a first path;

means for temporarily disabling the first switching module from transmitting data units for the flow;

means for transmitting a second data unit for the
5 flow from the first switching module to the second
switching module on the second path.

11. The path transitioning data switch of claim 9
wherein the means for transmitting a first data unit
15 transmits the data units for the flow on the first path
before the flow is transitioned from the first path to the
second path, and wherein the means for transmitting a
second data unit transmits the data units for the flow on
the second path after the flow has been transitioned from
20 the first path to the second path.

12. The path transitioning data switch of claim 11 wherein the first path includes a multicast fabric, the second path includes a unicast fabric, and the means for transitioning the flow transitions the flow from the multicast fabric to the unicast fabric after an address of a network device that provides the flow undergoes source learning.

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temporarily disabling the first switching module prevents the first switching module from transmitting the flow from the network device to the backplane while the address of the network device is undergoing source learning.

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14. A path transitioning data switch of claim 12 wherein the first switching module is coupled to the network device that provides the flow, and the means for temporarily disabling the first switching module prevents the first switching module from transmitting the flow from the network device to the backplane for an interval to ensure that all data units of the flow have cleared the multicast fabric.

15 15. The path transitioning data switch of claim 14 wherein said interval is predetermined.

16. The path transitioning data switch of claim 13 wherein the means for temporarily disabling the first switching module includes means for discarding data units and means for instructing the means for discarding data units to discard the data units for the flow.

17. The path transitioning data switch of claim 16 wherein the means for temporarily disabling the first switching module further includes means for instructing the means for discarding data units to stop discarding the data units for the flow.

18. The path transitioning data switch of claim 14 wherein the means for transmitting a second data unit

transmits the second data unit on the unicast fabric after the source learning has been completed.

19. A path transitioning data switch having a plurality of switching modules and a backplane interconnecting the switching modules, the data switch comprising:

means for transmitting a first data unit having a first address as a destination address over the backplane;

10 means for transmitting a second data unit having the first address as a source address over the backplane; and

means in response to the second data unit for temporarily disabling transmission over the backplane of data units having the first address as a destination address.

20. A path transitioning data switch of claim 19 wherein the first address is associated with a network device coupled to a first switching module, and the data switch performs source learning of the first address after receiving the second data unit from the network device.

21. A path transitioning data switch of claim 20 wherein the means for temporarily disabling transmission prevents transmission of the data units having the first address as the destination address while the first address undergoes source learning.

22. The path transitioning data switch of claim 21 wherein the means for temporarily disabling transmission includes means for discarding data units and means for

instructing the means for discarding data units to discard the data units having the first address as the destination address.

5 23. The path transitioning data switch of claim 22 wherein the means for temporarily disabling transmission further includes means for instructing the means for discarding data units to stop discarding the data units having the first address as the destination address.

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24. A path transitioning data switch of claim 20 wherein the means for temporarily disabling transmission prevents transmission of the data units from the network device to the backplane for an interval to ensure that all
15 data units having the first address as the destination address have cleared the backplane.

25. The path transitioning data switch of claim 24 wherein said interval is predetermined.

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26. A method of flow path transitioning in a data communication switch having a plurality of flow paths and a plurality of network interface modules, the method comprising the steps of:

25 receiving a first packet having an unknown source address from a source device coupled to a first network interface module;

transmitting the first packet over a first flow path to one or more network interface modules; and

30 performing source learning of the source address, wherein the first network interface module is

disabled from transmitting packets from the source device to other network interface modules while source learning of the source address is being performed.

5 27. The method of flow path transitioning of claim 26 wherein other network devices are disabled from transmitting any packet having the source address undergoing source learning as a destination address over the flow paths until source learning has been completed.

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28. The method of flow path transitioning of claim 26, the method further comprising the step of:

transmitting a second packet from the source device over a second flow path to a second network switching module after the source learning has been completed,

wherein the first flow path includes a multicast fabric and the second flow path includes a unicast fabric.

20 29. A data communication switch having a backplane and a plurality of network interface modules interconnected over the backplane, each network interface module comprising:

an access controller having a port for receiving a plurality of packets;

a switching controller coupled to the access controller for receiving the packets from the access controller, and for processing the packets for routing; and

a fabric controller coupled to the switching controller for receiving the packets from the switching controller, and for processing the packets for transmitting

over the backplane to one or more other network interface modules,

wherein the fabric controller receives packets from the other network interface modules and provides them to the switching controller, and the switching controller provides the packets from the other network interface modules to the access controller for transmitting out of the port.

10 30. The data communication switch of claim 29, wherein the backplane includes a unicast fabric, a multicast fabric and a management interface module, and wherein the fabric controller is used to transmit the packets over either the unicast fabric or the multicast fabric.

15 31. The data communication switch of claim 30 wherein the management interface module provides a fabric control update signal to the fabric controller with an instruction to discard packets for a flow undergoing a path transition from the multicast fabric to the unicast fabric, and wherein the fabric controller discards such packets.

20 32. The data communication switch of claim 30 wherein the management interface module provides a fabric control update signal to the fabric controller with an instruction to discard packets having a source address of a flow undergoing a path transition from the multicast fabric to the unicast fabric as a destination address, and wherein the fabric controller discards such packets.

36. The method of claim 35 wherein the step of disabling the first network interface module includes the step of providing a discard indicator to the first network interface module, wherein the first network interface module discards all packets of the flow in response to the discard indicator.

37. The method of claim 35 wherein the step of disabling all other network interface modules includes the step of providing a discard indicator to all other network interface modules, wherein all other network interface modules discard all packets having the source address as a destination address.

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